ABSTRACT:

This paper presents a high efficiency non-isolated bidirectional converter which can be employed as an interface circuit between ultracapacitors or batteries and DC bus voltage. All semiconductor devices in the proposed converter are soft switched while the control circuit remains PWM. So, the energy conversion through the converter is highly efficient. The proposed converter acts as a zero-voltage transition (ZVT) buck to charge an ultracapacitor or battery and acts as a ZVT boost to discharge an ultracapacitor or battery. The performance of the proposed converter with respect to abrupt load and operating mode change is shown through computer simulation results. The results confirm the aforementioned advantages and features of the proposed converter.